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THE GEOGRAPHY COURSE IN THE CHICAGO NORMAL SCHOOL

PART I

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THE organization of all courses in the Chicago Normal School is adapted to the well-defined conditions peculiar to the school. The fact that the Chicago Normal School stands at the head of the Chicago school system to prepare graduates of the Chicago schools to be teachers in the same system, gives the school the advantage of limitations which normal schools do not often enjoy. All entering students have had equal and practically the same chances for preparation in the Chicago schools All graduates must be especially trained to meet the conditions peculiar to the Chicago schools. Hence the course in geography, here presented deals only with these known conditions of entrance and attempts to meet these known conditions of demand, but at the same time it aims to give such a preparation for general teaching that the students may be well prepared to teach in other environments than those prevailing in the Chicago Public Schools.

It is assumed that a student entering the Chicago Normal School has had all of the strictly academic study of geography that is necessary to allow of his treating the subject-matter as the acquired building material with which he works. The course in geography is entirely a professional study of the subject and it is found that the students do get a better review of the subject-matter of geography by approaching it from the standpoint of the teacher than those, with equal preparation, did under the previous course, by a simple academic study. The professional study is divided into two distinct divisions:

1. The study of the subject from the point of view of the subject-matter alone, with the conscious aim of discovering the organization

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inherent in the subject-matter. This procedure must include a close scrutiny of the different parts of the subject-matter to discover the relations existing between the parts as applied in the study of certain wholes. Such is the intent of the first year's work as outlined.

2. The study of the subject from the point of view of the child with the conscious aim of adapting the subject-matter to the growing consciousness of the child. This must include a psychological study of the child to determine his ability for mastering and his mental processes of comprehending certain parts of the subject-matter at certain ages. Incidentally it also includes the discovery of the disciplinary value of the subject. Such is the intent of the second year's work as outlined.

After this preparation, as outlined, each student is given a chance to practice teaching the subject in one of the grades for six weeks. This teaching work is done under the direct supervision of the regular grade critic teacher and the geography department.

FIRST YEAR OF GEOGRAPHY

(*Fourteen weeks, five fifty-minute periods weekly.*)

I. INTRODUCTION

A. A Consideration of What Geography Is; viz., "A study of the earth in its relation to life."

1. Earth factors determining life conditions.
   - *a.* Climate.
   - *b.* Structure.
   - *c.* Examples showing the influence of these factors.

B. Educational Value of such a Study of Relations.

1. Discipline.
2. Culture.

II. THE EARTH AS A WHOLE

A. Shape.

1. Proofs.
   - *a.* A person moving north or south sees stars rise and set at an equally progressive rate.
   - *b.* The sun rises westward at the same rate.
   - *c.* Ships sailing with equal speed disappear in all directions at the same rate.
   - *d.* The shadow of the earth cast upon the moon during a lunar eclipse is always circular.
2. Results.
   - *a.* The pull of gravity is nearly the same all over the earth, hence:

(1) The moving of weights is easy.
(2) The atmosphere at sea level is of the same density.
Most men are adjusted to living under such a density.
(3) The earth has a comparatively level surface, hence:
(*a*) There is a wide distribution of organic species.
(*b*) Communication is easy.
b. We have the terms "up" and "down."
c. The curvature of the earth has to be taken into account in digging canals.

B. *Size in its Relation to Man's Life.*
1. Effect upon the intercourse of savage peoples.
2. Effect of railroads, telegraph lines, etc., in overcoming size.
a. Free exchange of products and ideas between all parts of the world.

C. *Spheres of the Earth.*
1. Atmosphere.
2. Hydrosphere.
3. Lithosphere.
4. Centrosphere.
5. Relation of spheres in space and comparative mass of atmosphere, hydrosphere, and lithosphere.
6. Interpenetration of atmosphere, hydrosphere, and lithosphere and its effect in furnishing conditions for life.

D. *The Lands.*
1. Arrangement about the North Pole.
a. Effect of massing of lands in the northern hemisphere upon the distribution of heat.
2. North and south projecting arms.
a. Effect upon ocean currents and distribution of heat.
3. Division into continents and islands.
a. Effect upon life in the development of species.
b. General triangular shape of continents.
c. Size of continents and effect upon the development of life.
d. Formation of the continents.
(1) Diastrophism.
Effect upon the surface.
(2) Vulcanism.
Formation of igneous rocks and surface forms.
(3) Gradation.
Formation of mantle rock, sedimentary rock, and surface forms.

E. The Oceans.

1. General arrangement and comparative size.
2. Relation to life.
   a. Sources of food, moisture, and means of cheap communication.

F. Movements of the Earth.

1. Rotation.
   a. Proof of rotation.
      (1) Deflection of falling bodies.
      (2) Foucault's pendulum.
      (3) Flattening at the poles.
   b. Results of rotation.
      (1) Gives a unit of time—the day.
      (2) Directions—points of compass.
      (3) Latitude and longitude.
      (4) Standard time.
      (5) International Date Line.
2. Revolution.
   a. Sun's apparent movement among the stars.
   b. The year.

G. Distribution of Heat on the Earth's Surface.

1. Nature of heat.
2. Modes of transference.
3. Measuring of heat—thermometer.
4. Sources of heat.
   a. Solar.
   b. Terrestrial
5. Distribution of heat due to slant of sun's rays.
   a. Distribution as observed in Chicago.
      (1) Daily distribution as shown by weather records kept by pupils.
      (2) Cause of daily distribution.
         (*a*) Comparison of angle of sun's rays received in the morning and at noon (by use of skiameter); at night.
         (*b*) Comparison of amount of surface covered by noon and morning rays. (By use of ski meter.)
         (*c*) Effect of rotation.
      (3) Yearly distribution as shown by change of seasons.
      (4) Cause of yearly distribution.
         (*a*) North and south apparent movement of the sun and its distance from our zenith at different seasons. Effect upon angle of sun's rays.

(*b*) Varying length of day. Place of sunrise and sunset and length of sun's path at the
Winter solstice.
Summer solstice.
Equinoxes.

b. Distribution on the earth as a whole.
(1) Region of vertical rays and greatest heat.
(2) Region of oblique rays.
(3) Cause of vertical and oblique rays.
(*a*) Comparative size of earth and sun and distance between them.
(*b*) Practical parallelism of all rays received from the sun.
(*c*) Effect of curved surface of the earth upon the angle which rays make with the surface.
(4) Shifting of vertical rays.
(*a*) Earth's orbit, shape, distance from the sun.
(*b*) Plane of the orbit.
(*c*) Attitude of the earth as regards this plane.
(*d*) Conditions of heat and light if axis were vertical to this plane.
(*e*) Amount of inclination of axis necessary to carry rays $23\frac{1}{2}°$ north and south of the equator.
(*f*) Fixed direction of North Pole.
(*g*) Combined effect of revolution, and inclination and parallelism of axis.
(5) Location of vertical rays and twilight circle at
(1) Winter solstice.
(2) Summer solstice.
(3) Equinoxes.
(*a*) Consequent length of day and distribution of heat.

c. Location and definition of zones of insolation, tropics, polar circles.

d. Visualization of sun's position at noon at different places on the earth's surface at
(1) Summer solstice
(2) Winter solstice.
(3) Equinoxes.

6. Winds.
a. Composition and pressure of the atmosphere.
b. Measuring pressure—barometer.
c. Changes in density and pressure.

d Movement as a result of difference of pressure.
e. Direction of movement from high to low pressure areas.
f. General circulation of the atmosphere.
(1) Region of greatest heat on earth's surface.
(*a*) Effect upon density and pressure of air.
(2) Formation of
(*a*) Trades.
(*b*) Belt of equatorial calms—doldrums.
(*c*) Antitrades
(3) Effect of rotation of the earth.
(*a*) Deflection of air currents.
(*b*) Circumpolar whirl.
(*c*) Low pressure areas at the poles.
(*d*) High pressure at about 30° north and south latitudes.—Horse latitudes.
(*e*) Westerlies.
(4) Effect of migration of vertical rays.
(*a*) Shifting of wind belts.
(*b*) Deflection of trade winds as they cross the geographical equator. Terrestrial monsoons.
g. Effect of land and water surface on general circulation due to
(1) Unequal heating of land and water.
(*a*) Continental monsoons.
(2) Obstruction of land.
h. Effect of winds upon the formation of ocean currents.
i. Effect of winds upon the distribution of heat
j. Summary as to the distribution of heat on earth's surface by a study of isothermal charts.

H. Rainfall.
1. Presence of moisture in the air.
a. Relation to heat.
b. Relation to bodies of water.
c. Humidity.
(1) Measuring amount of,—hygrometer.
2. Conditions causing rainfall.
a. Chilling of the air due to
(1) Ascending currents at region where the sun's rays are vertical—zenithal rains
(2) Storms.
(3) Mountain deflection
(4) Latitude.

3. Measuring amount of rainfall.
   a. Rain gauge.
   b. Average annual rainfall of Chicago.
   c. Average annual rainfall necessary for agriculture.
4. Distribution through the year.
   a. Relation to vegetation.
   b. Relation to agriculture.
5. Rainfall of different wind belts.
   a. Effect of highlands upon distribution.
   b. Effect of cyclonic storms.
6. Study of rainfall map and summary as to distribution of rainfall.

I. Vegetation Zones.

1. Factors essential to plant growth.
2. Distribution of plants in Chicago environment.
   a. Typical areas.
      (1) Sand dunes.
      (2) Swamps.
      (3) Prairies.
      (4) River valleys
3. Geographical distribution of plants; control by temperature.
   a Heat belts
      (1) Polar cold caps bounded by isotherm of 50° for the hottest month which marks the northern limit of trees and most hardy cereals.
      (2) Hot belt bounded by the annual isotherm of 68° which marks the limits of palms.
      (3) Temperate belt.
   b. Tundras and barren lands of polar cold caps. Characteristic plants — mosses, lichens, dwarf birches, stunted berry-bearing bushes, bright colored flowers, gentians, anemones, etc. Animal life and people studied in relation to the environment.
   c. Distribution of vegetation in the temperate belt in relation to moistures.
      (1) Temperate forests, coniferous and deciduous.
      (2) Steppe lands.
      (3) Deserts.

      Influence of the different areas upon the animal life and upon man's mode of life.
   d. Distribution of vegetation in the hot belt in relation to moisture.

(1) Tropical forests.
(2) Savannahs.
(3) Deserts.

Influence of the different areas upon the animal life and upon man's mode of life.

III. NORTH AMERICA

A. *Position on the Globe.*
1. Position in the northern hemisphere.
2. Position in relation to oceans and other continents
3. Advantages of position between densely peopled regions of Europe and Asia.

B. *General Shape and Size.*
1. Advantage of wide extent in temperate belt.
2. Advantages of extent in latitude.

C. *Physical Features.*
1. Arrangement of highlands.
2. Comparison of highlands as to extent, height, and general appearance.
3. Drainage areas as formed by slopes of highlands.
   a. Atlantic.
   b. Great Lakes.
   c. Guif of Mexico.
   d. Pacific.
   e. Great Basin.
   f. Hudson Bay.
   g. Arctic.
4. Lowlands in part formed from debris washed down from highlands.

D. *Glaciation.*
1. Valley glaciers
   a. Location.
   b. Origin.
   c. Movement.
   d. Work.
2. Continental glaciers.
   a. Present—Greenland Antarctic.
   b. Ancient—North American ice sheet.
      (1) Centers of ice accumulation.
      (2) Extent.
      (3) Work done in Canada and New England.

(4) Work done in Northern Mississippi Basin region.
(5) Origin of Chicago plain, topographic features, and its influence upon the growth of a great city.

E. Climate.
1. Winds.
   a. Part of continent in each belt.
   b. Effect of seasonal shifting of belts
2. Temperature.
   a. Part of continent in different heat belts
   b. Effect of winds and ocean currents on east and west coasts.
   c. Comparison of interior with coasts.
3. Rainfall.
   a. Distribution in relation to highlands.
   b. Effect of cyclonic storms.
   c. Influence of the Gulf of Mexico.

F. Life.
1. Part of continent in different vegetation zones.
2. Influence of the above distribution upon the industrial life of the continent.

IV. PHYSIOGRAPHIC REGIONS OF THE UNITED STATES

Lake and Prairie Plains.
New England Upland.
Atlantic Coastal Plain.
Piedmont Belt.
Appalachian Ranges.
Allegheny Plateaus.
Gulf Coastal Plain.
Alluvial Plain of the lower Mississippi.
Ozark Mountains.
Great Plains.
Rocky Mountains.
Columbia Plateau.
Colorado Plateau.
Basin Ranges.
Pacific Mountains and Valleys.

NOTE:—The lake and prairie plains are first studied because the students are within this environment. Next, the New England plateaus are studied as a contrasted glaciated area. Each region is studied according to the general plan outlined below for the lake and prairie plains.

A. Lake Plains and Prairie Plains; the Northern Glaciated Part.

1. Location and extent.
2. Characteristic features.
   - *a* Level or undulating surface. Low hills of glacial origin.
   - *b.* Drained and terraced lake beds.
   - *c.* Young valleys, falls akes
   - *d.* Glacial soils.
3. Climate
   - *a.* Great range of temperature.
   - *b.* Length of growing season from four to six months.
   - *c.* Rainfall from twenty to forty inches.
4. Industrial regions.

   Forest areas.
   Wheat region.
   Corn belt.
   Iron region.
   Coal regions.

   - *a.* Location and extent of each.
   - *b* General characteristics of the industry.
   - *c.* Amount and value of the products.
   - *d.* Markets.
   - *e* Allied industries.
   - *f.* Amount and value of industries as to states.
5. Important centers.
6. Trade routes.

   Great Lakes.
   Mississippi River.
   Railroads.

V. POLITICAL DIVISIONS

Organization of the whole as seen through study of the political divisions.

NOTE:—Each pupil is required to make a sand model and a chalk modeled relief map of the whole continent and of the different physiographic regions

No one text-book is used, for students are referred to different texts found in the library and in the geography room.

During the study of the earth as a whole weather records are kept and regular observations of the sun's position made

(To be concluded.)

MAP MAKING AND MAP READING

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INTRODUCTION

IT was the privilege of the writer, during the past summer, to conduct a number of field excursions in geography with North Carolina teachers. At the outset, many of the teachers expressed the desire to undertake map making out of doors. Every one of the teachers had followed, to the best of her ability, the directions which her own school text-book and the supplementary books had yielded for mapping the schoolroom or school yard. They were not sure, however, that the result of their conscientious endeavors was the desirable one, nor were they sure why the books were insistent upon this exercise. Furthermore they were not certain when this work was done that any more in this line was demanded of them. They were not on familiar ground. A similar uncertainty exists among teachers generally, for nearly all are in doubt as to the advisability of even trying map drawing in school work.

The present condition is, in part, the result of lack of clearness and completeness in the statement of what is desired, and is a good illustration of the unfortunate period which often follows the promulgation of new ideas, between the time of a teacher's schooling and her assuming a teacher's responsibilities, when the medium for the transmission of the ideal of reform does not adequately enlighten. The best thing concerning map drawing has not been said. Along many lines of map work there are differences of opinion, and hence it is not strange that the teacher hesitates. The present article is not written to cover the whole field of map exercises, but to present certain helpful points in reference to a few fundamentals. The writer assumes the responsibility of no new ideal, but insists on a more careful plan and longer training in order to realize as far as possible the old. Its specific aim is to aid a number of teachers who have in times past sought aid, and it has been submitted for publication only in the belief that there is a general desire for help in this direction. No attempt will be made to divide the work according to the demands of the grades, but all of the suggestions are applicable to the work of the elementary schools.

FIRST STEPS

The first duty of a teacher is to lead the pupils to realize that the map is a reproduction, to scale, of a portion of the earth. This is

not altogether a simple task. The present-day judgment concerning the best method by which this idea may be inculcated finds its expression in the directions for map drawing in most elementary books on geography. The steps are three—reproduction, reproduction to scale, and an oriented reproduction to scale. The first introduces the child to symbols and may easily represent a lesson in drawing. A very crude rectangle, as a sign for the schoolroom, is the temporary goal. The second has for its object the sense of proportion. The third combines the sense of direction and location. Finished work cannot be expected during this stage, but the essentials should be strongly emphasized. Here may be ingrained neatness and care without which no success in map work may be attained. A very poor drawing in the elementary stage may be made with neatness and care.

SCALE

Passing over the elementary drill on the scale which is well discussed in many books, let us turn to another phase of the subject. Every map made by the pupils should have a scale appended. As a map of a locality, it is imperfect without one. Some maps used in the schools, such as the Mercator projections, because of an increase in the scale with an increase in latitude, do not lend themselves readily to an expression of distance or size. The scale may be stated in two ways, either by the number of feet or miles represented by one inch of the reproduction, or by stating the fractional part the reproduction is to the area itself. The former is the common method in school atlases to-day, and the scale is often expressed by a line segmented to the proper lengths. The latter is the method used by government surveys. The topographic maps of the United States Geological Survey, for instance, have their scale expressed as $\frac{1}{62500}$, $\frac{1}{125000}$, etc. The interpretation is simple. One inch, foot, or metre on the map is equivalent to 62,500 inches, feet, or metres on the surface of the earth. It expresses at once a ratio between the reproduction and the actual. It has a value beyond its simplicity. It is expressed in a universal language. The unit of measurement may be different as it is in the various nations, the language may be a strange one, but the fraction stating the scale of a map allows but one interpretation.

In mapping a school yard, using the pace as a unit of measurement, the scales of the maps of twenty pupils would tend to confuse rather than enlighten, and the teacher who has to correct the reproductions has no basis for comparison. In pacing, the pupil should be taught to walk naturally. To try to lengthen the step to a yard

is wearisome, often impossible for children, and certainly ungainly; and in much such pacing the steps are unconsciously shortened. Each pupil may ascertain the length of his natural step by walking over a measured distance a number of times and dividing the number of steps taken into the entire distance. This will serve as a unit of measurement for all out-of-door mapping. The transformation to the fractional scale is not difficult and may serve as a lesson during the mathematics period. It seems best to urge the use of this scale on all maps constructed by the pupils.

COMPASS

The reproduced school yard is not complete without a symbol for orientation. The ordinary one in use is an arrow pointing towards the geographical pole. It is possible that the meridian line has been found by the sun, and a mark on the ground, or a chalk line on the bricks, exists as the class's determination of the north and south line. The introduction of the compass, in its proper time, on this line, will show the deviation between the geographical and magnetic meridians, and a second line across the first, parallel with the compass needle, will mark the direction of the magnetic pole. In the corner of the map may then be added, pointing in the proper directions, these two lines.

When the pupils are fairly sure of the meaning of orientation, a useful exercise may be given by passing out papers with the compass indicated and allow them to draw the map of the yard. On the ordinary atlas maps, meridians serve the office of the needle. The transformation from reading a map with a compass to reading a map with projected meridians has been slighted. The idea that up on the map is north, and right is east, introduces an error from which even the teachers of geography are not free. Pupils are not corrected for ignoring the meridian lines of a map. Many pupils are not taught to see them. Without the meridians, what is below is south. A distorted idea is thus gained. Take the map of North America, and, without consultation, let the teacher state for herself, or allow the pupils to tell, what city in the United States lies almost north of Havana. Few pupils are loath to name a city west of Albany, and in a gathering of half a dozen teachers, one with hesitation answered Buffalo. A few problems of this nature will show how essential is an emphasis on the meridian lines of a map, especially far to the east and west of the centrally-projected meridian. This difference between a map with a compass symbol and some meridian-marked maps should be fixed upon the attention as early as possible.

XUM

SYMBOLS

Map reading is an interpretation of symbols. From the very beginning of geography, the introduction of symbols is proper. "Conventionalization and symbolization seem to be an inborn trait of the human family." *

The first maps should be the means of introducing a few symbols. No generally accepted list of symbols for use is published. Text-books vary somewhat in the points, emphasized slightly up to this time. The topographic maps of the United States Geological Survey may be taken for a standard. At some time in the grade a familiarity with these maps is advisable, for the legend is simple and easy. There seems to be no argument against the use of a few of their conventional signs. In a district map, where roads, bridges, brooks, and buildings are used and plotted, some legend is demanded; the one that is to be used later, if within the comprehension of the pupil, is the proper one.

Writing on the maps should not be encouraged when the symbol is definite. The writing of "street" on the symbol for the same, "river" on its symbol, defeats the use of the sign language. If the sign is there, the word is superfluous. As long as a universal sign language for maps has not been accepted, a legend must be appended to every exercise. Some elementary books use as a symbol for "tree" a printed outline of a tree. Two objections may be raised to such kinds of symbols. In the first place the printed outline takes more room than the space marked out for the tree according to the scale of the map, and again it will not be easy to persuade the child that it is a symbol, not a picture; that the house cannot be pictured by its outline, a bridge by the same method; that a stone wall or a fence cannot be introduced in a similar way; that a pictorial plan is not a map.

Water and culture lines should be started early in the work. As soon as possible the relief lines should be begun. Reading relief from contour lines is a habit to be cultivated.

CROSS-SECTION

The topographic maps are superior to most maps in ordinary use. The maps are contoured for every 20, 50, or 100 feet of vertical height. The idea of contour lines is best obtained from a field exercise. If a locality is selected in which a hill rises sharply from a level base, the problem may be easily expounded. The base will be the zero line. For every foot of height, if the hill be low, a pebble may be placed on the slope. A line of pebbles around the hill will mark, then, the foot

* Redway, *New Basis of Geography*, page 139.

contour line. In mapping, plot the pebble lines as one would were they roads. While still in the field, a cross-section may be started. Standing to one side where a view of the hill, sharply outlined, may be had, sketch the outline. Then, by pacing, make the outline to scale. The steps to the drawing of a cross-section of one or two portions of a topographic map are then simple. A little of such work should be done; a great deal is a waste of time.

Cross-sections should always be drawn with the vertical scale and horizontal scales alike. The transposition of a 1500-foot contour to the scale of $\frac{1}{62500}$ should be practiced until it is made easily. One or two well-selected cross-sections will fix the insignificance of the irregularities of the earth. A section of the ocean depths from the mouth of the Amazon to Libreville in the French Congo, along the equator, is an excellent choice. The distance is approximately 60° of arc. With a 12-foot radius the irregularities of the ocean floor do not appear. The width of the thinnest line is then too wide to show the ocean depth.

A FEW ILLUSTRATIONS

For a first exercise in mapping—the preliminary consideration of scale being understood—the remnant of a hill was used. The locality was selected because the slope was prominent. The emphasis of the exercise was placed on compass readings and contour lines. Four points, *A*, *B*, *C*, and *D* (Figure 1), were selected as the corners of the area.

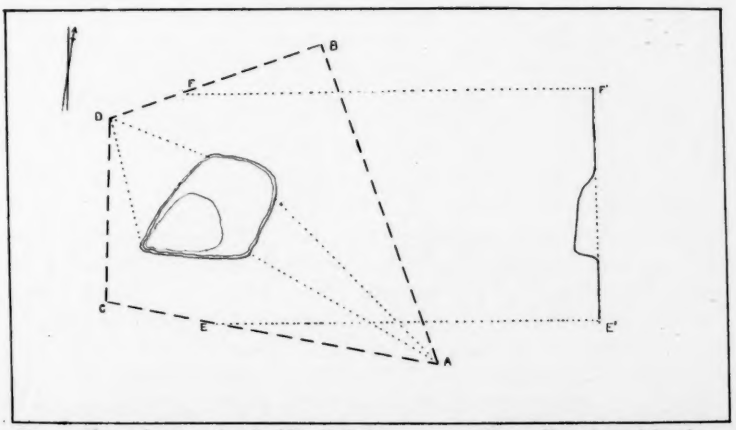

FIG. 1. *Map and cross-section of a hill. Scale, 1/500. ——— Contour lines; interval three feet.*

The data, obtained by the pupils, were as follows:

From *A* *C* is N 80° W. 53 paces.
B is N 20° W. 53 paces.
SE base of hill is N 60° W. 34 paces.
NE base of hill is N 45° W. 36 paces.

From *D* *B* is N 70° E. 36 paces.
C is due S. 28 paces.
NW base of hill is S 70° E. 17 paces.
SW base of hill is S 15° E. 20 paces.

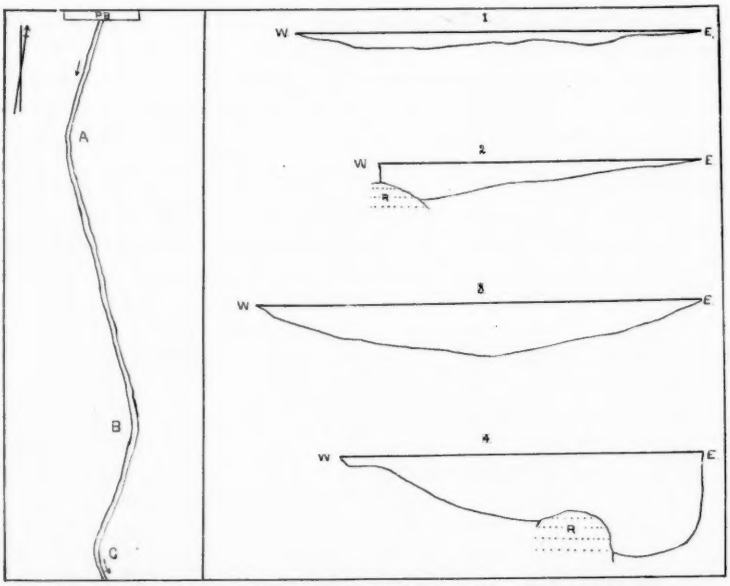

FIG. 2. *Map and cross sections of brook. Scale of map,* 1/400. *Scale of section,* 1/10. R *rock.* P B *park bridge.*

Stations *B* and *C* are used to check the above readings. The contour lines may then be plotted from the stations at the base of the hill. The height is an average estimation, and the horizontal distances between the contours are determined in the same way. A cross-section is then added.

Another exercise, Figure 2, was undertaken along a neighboring brook. All distances along the brook were paced. All measurements of the width and depth of the brook were measured accurately.

Data:

From Bridge (P. B.) brook runs S 12° W. 19 paces to Bend *A*.

From Bend *A* brook runs S 15° E. 45 paces to Bend *B*.

From Bend *B* brook runs S 20° W. 12 paces to Bend *C*.

From Bend *C* brook runs S 20° E, and on.

1. Cross-section in straight reach between *A* and *B*, depth expressed in cm., readings every 10 cm. from west to east.

0 1.4 3.6 3.5 3 2 2.8 2.5 1 0

Current swift.

2. Same at Bend *C*.

5 (*rock*) 9 8.7 5.3 4.4 3.6 2.9 1.2 0

3. Same in straight reach between *B* and *C*.

0 5.8 7.8 10.4 11.5 12.4 12.2 10.5 9.5 7 4.9 0

Current slow.

4. Same at Bend *B*.

2. 2.5 8.6 11.5 14.3 16 12.8 (*rock*) 26 25 19.9 (*undercutting*)

A third exercise, Figure 3, was conducted along a strip of coast.

Data:

From *A* (*rock*) beach runs N 12° E.

Beach runs S 20° E to S 70 paces.

From *S* to *B* (*rock*) line runs S 45° W. 107 paces.

From *B* to *T* E. 57 paces.

From *T* to *C* (*rock*) S. 30 paces.

From *C* rock extends west 13 paces.

From *C* shore runs E to *D* (*rock*) and on.

In this exercise, as in the others, the data were supplemented by rough sketches and some attempt was made to incorporate into the maps the ideas expressed in the free-hand outline. Thus the slight irregularities in the curved coast line between *A* and *B* were observed and mapped.

INFERENCES FROM EXERCISES

The journey to the brook opened a number of interesting problems. These may be considered in papers presented by the pupils. It is very evident that in the bends of the stream one kind of cross-section obtains, while in the straight reaches the section was of a different type. Notes were made concerning the swiftest part of the current in each section; that this swiftest line of flow crossed the channel was among the conclusions. That is hardly a safe principle that would apply all the results of an investigation of 150 feet of a single stream to all streams. It is better to leave a few problems unsettled until

further investigation and observation allow a definite answer. Thus, from the stream measurement, it seems to be a natural deduction that the swifter parts of brooks have a shallower flow of water than the

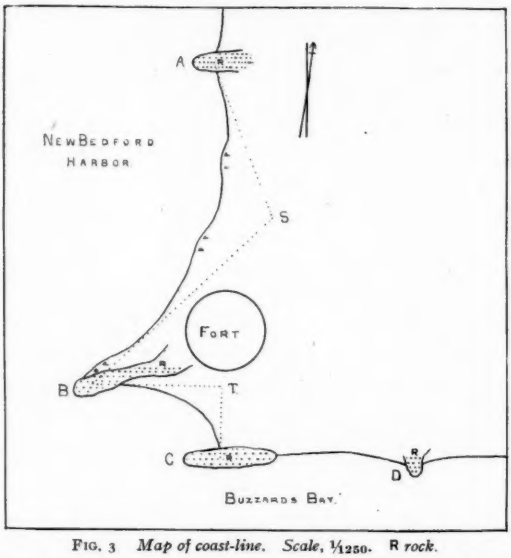

FIG. 3 *Map of coast-line. Scale,* 1/1250. R *rock.*

slower portions. Some problems will be presented that can not be solved, either because of lack of time or because of insufficient data. It may be convenient to some members of the class to investigate the brook further and to present a more comprehensive report on one or more problems. At least it is well to leave the exercise in such a way that, either as an investigator of the physics of rivers, or as a casual observer, the pupil may approach a stream, not in the belief that all its ways are known, but with the inspiration from knowing something of its history, and the enthusiasm which the hope of discovery begets.

The conclusion from the shore map should be treated in a similar manner. A reserve of judgment is advised. In regard to the location studied, let the statements be definite. At the Fort (Figure 3), the salients are rocks, and between them the beaches are curved. That all salients are rocks might be a next step. Between *A* and *B* bunches of shore grass catch the sand and cause slight irregularities in the curve of this beach. The case is so evident in the field that it is remarked upon by a pupil. Perhaps, then, some other things besides rocks mark the salients of a coast. An island in the harbor, showing

the white line of a sand spit, reënforces the statement. At a later period these may enter the discussion and be investigated. For the present we know that rocks form salients, and are one cause at least for the irregularities of coast lines.

MAP DRAWING

Before map reading is perfected, a conception of the error of the maps in constant use is necessary. It has been the general printed opinion that exercises in map projections, although ideally a desirable part of a child's knowledge, are best not considered in the grades. There are many things in projections that mature minds only can grasp; at the same time there are some elementary considerations in the subject which should be properly delegated to the geography teaching in the schools below the Secondary. The study of a globe follows naturally the construction of the maps of limited areas. The child may believe, as the human race did in its infancy, that the earth is flat. The introduction to a spherical earth at this time repeats the race history. At some later time in the grades the spherical maps and the flat maps must be considered in comparison. There is no better way than to have the child construct two or three types.

A Mercator map is not beyond the child's comprehension. With little difficulty, a figure, like Figure 4, may be made. The pupils should

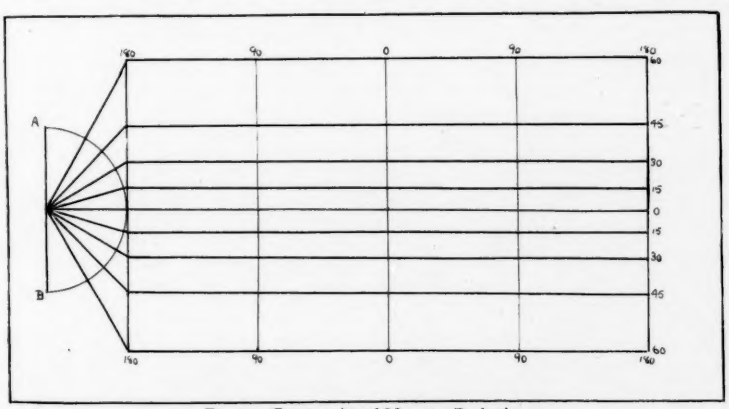

FIG. 4. *Construction of Mercator Projection.*

have the small hand globes. If the diameter, AB, is made equivalent to the diameter of the globe, the later comparisons are more obvious. The equator of the map should equal in length the circumference of the globe. When the diagram is made the map may be begun. It

is not necessary to complete the whole map of the world, but enough of it must be undertaken to show the distortion. It may be advisable to plot points only, as Cape Farewell and Christiania on the 60th parallel. Compare the plotted distance with the true. In like manner take locations nearer the equator. Then the latitudinal distortion may be proved in a similar manner, or a teacher may consider it wise to construct a map of North America after having plotted thirty or forty points around its coast. Here may be emphasized at the same time the preliminary steps of great circle directions. An investigation of the shortest distance between Mt. McKinley, Alaska, and St. Petersburg, on the globe, and on the Mercator projection, will easily show that the latitudinal direction is not the desirable one in point of distance.

Constructions of other projections would consume too much time. If, however, blank outlines of one or two projections in common use be furnished the pupil, a similar use may be made of them. It is advisable to have the circumference of the globe and the circumference of the projection alike at first, as direct comparisons may then be made without the confusion of a change of scale.

The plotting of points from a globe is beneficial, furthermore, because the pupil must say to himself the latitude and longitude of the localities plotted, a thing that map copying does not make necessary.

MAP READING

"Teaching words before ideas has the same effect as teaching a map without associating it with that which it represents. The problem of how to lead children to use maps properly, that is, to make a map a means of developing thought power, is an exceedingly serious and important one. All directions and suggestions, therefore, should tend toward this one purpose." So said Francis W. Parker.*

Stress has been laid, up to this time, on the construction of maps; not, however, as an end in itself, but as a means of acquiring some of the habits of map reading. If, in its proper time, there should be added to this foundation the knowledge of the wind belts and the ocean currents of the earth, a great deal of the text of a geography may be discovered by the pupil. In order that this work may be carried on safely, the best maps should be employed. A more intelligent understanding of geographic relationships may be attained from an increasing use of questions demanding judgment and reason. Further expansion of this would only repeat what has already been printed in this JOURNAL.†

* *How to Study Geography*, page 92.

† *Journal of Geography*, Vol. I, "The Use of Maps in the Teaching of Geography," page 97, 1903.

INDUCTIVE METHOD OF TEACHING CHANGE OF SEASONS

BY R. S. HOLWAY
Of the University of California

CAN grammar school pupils determine the causes of the change of seasons by their own observations and by experimental study of possible solar systems? Several years' trial with students in secondary schools has entirely convinced me that for them this method of studying change of seasons is thoroughly practicable and satisfactory. Recently I have had a senior in the University of California try the plan in her practice teaching in an eighth grade class under the usual public school conditions Apparently these children master the main ideas as readily as do adult students. While the work was not carried so far as it would be with older students, the account below

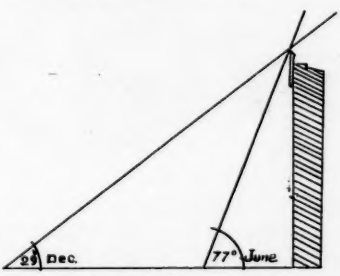

Fig. 1

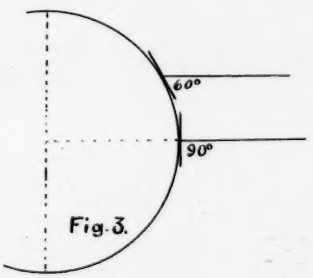

Fig. 3.

will show, I think, that this eighth grade learned more and reasoned more than the average grammar school student does by studying the text.

I will present the work substantially in the order that it was given, and the headings of the paragraphs will constitute an outline of the lessons.

Observation of a shadow cast by the sun at noon. Beginning the first part of September a peg was fastened in the sill of one of the south windows and the point of the shadow of this peg at noon was marked on the floor below. (See Fig. 1.) The window was raised to get clearer sunshine. Various predictions were made by the children in answer to a question as to whether the point of the shadow would come to the same point on the floor the next day at noon. As they watched the

marked lengthening of the shadow during the week following, many of the class expressed great surprise.

In response to questions they answered readily that the sun must be getting lower in the sky each noon to produce a longer shadow. They also assigned this as a probable cause of the winter's cold.

Space covered on different parts of a sphere by the same beam of sunshine. Through a hole in a piece of cardboard sunshine was allowed to fall on the surface of a g obe and the varying area covered was noted. The deduction is easily made that the heating effect of sunshine is greater the nearer the rays come to being perpendicular to the surface.

What the gyroscope teaches about rotating bodies. The gyroscope shown in the figure was made by mounting a six-inch sewing machine wheel on ball bearings in the fork of an old bicycle. (See Fig. 2.) With a stout string one can spin it so fast that it will run for nearly five minutes. The great advantage that this gyroscope has over the one commonly

FIG. 2. *Home-made gyroscope*

sold to high schools are its simplicity, the ball bearings, and the greater weight. Taking it in the hand when the wheel is rotating rapidly one feels a wonderfully strong resistance when an attempt is made to *change the direction of the axis of the whirling wheel.* It may be carried around the room without feeling this resistance, if the axis is kept parallel to its first position. This experience enables the children really to appreciate the primary fact underlying the change of seasons, namely that the earth because it is a whirling body keeps its axis constantly in the same direction. The gyroscope can also be suspended by a cord and carried around in a circular orbit. If properly balanced, it will twist its supporting cord and keep its axis constant in direction. The children easily perceive the point of the experiment and a little questioning will lead them so to phrase their ideas that they will be available in future work.

Description of a planet with its axis perpendicular o the plane of its orbit. All the children were familiar with the idea of an earth going around a sun and so they were asked to carry an earth with a vertical

axis around a sun—a circular orbit being used. They at once located vertical sunshine at the equator of such an earth and saw that it would be constantly on that line. Day and night were correctly explained but with little interest—the problem having evidently been long solved The elevation of the sun at noon for a man at different latitudes requires some drill, especially as to the meaning of horizon. A card held on the globe at the equator and slid toward the pole is a great help. They finally saw (Fig. 3) that a man going north 30° from the equator would tip his horizon 30° and that hence the sun that is 90° high at the equator is only 60° high in lat. 30°. The teacher must remember here in drawing any diagram that the sun is not close at hand, as in the concrete illustration, but at such a great distance that its rays are sensibly parallel. The children must be led to see that this man has no change in noon elevation of the sun and hence no change of seasons during the year.

Does our earth have its axis perpendicular to the plane of its orbit? The children were next told that they were to answer a question about our own earth entirely from their own observations. The statement of the question above brought a look of surprise that they could be expected to know anything about our big earth without the help of books. But in a few seconds one could see the flash of intelligence come first in one face and then in another, until soon the majority of the class were wildly eager to answer. They referred to the varying length of the noon shadow and said they *knew* our earth could not have its axis perpendicular to the plane of its orbit. In the class this fall this part of the work was particularly enjoyable, for one boy had but recently remarked that "only the wise men" could study out such things as the text-book tells about the change of seasons.

Description of an earth with its axis tipped. A globe rotating on an axis inclined 10° from the perpendicular was next assigned to be carried around a central sun. It is well to have the sun in the center of the room and to use a large orbit. Here, of course, some of them had to be reminded of the gyroscope before they would keep the axis of the rotating earth constant in direction. As soon as that was done they saw that vertical sunshine varied from 10° north to 10° south of the equator, making a torrid zone. It is a more difficult problem to work out the noon elevation of the sun for a man living at (say) 30° north latitude. But with care they saw that the noon elevation would vary from 70° to 50° during the year.

Is our earth an earth with its axis ilted? This question is readily answered by a reference to the changing noon shadow. It is really

answered too readily for of course, as original work upon the part of the children their proper answer is merely that it may be. In due time the children should be led to see that while they have worked out a scheme that may be true for our solar system, yet they have not fully proved that it is the scheme.

Does a planet with its axis inclined have summer and winter? This is a variation of the work already done, but if their attention has been centered upon the changing noon elevation of the sun, the children may not realize that they have been studying change of seasons. The question about summer and winter serves to correlate their recent observations with their past experiences of summer's heat and winter's cold.

If the axis of a planet is tipped 15°, *what zones of sunshine result and what are their boundaries?* The torrid zone and its limits are seen at once. Usually it requires some more time to establish the changing conditions of sunshine in passing from the frigid into the temperate zone.

Care must be taken that the children really grasp the relation of the amount of tip of the axis to the width of the torrid zone and to the varying noon elevation of the sun. Work well done here will prevent confusion in the future.

Can you measure for yourselves the inclination of the axis of our earth? If the preceding work has been well done by presenting each problem in various forms and with several inclinations for the axis of the earth, the children will see that the shadow of the peg in the window-sill gives them an answer to this question. If the pupils have not measured angles they must be given simple protractors and made to measure various angles for practice. The elevation of the sun can be measured by putting the protractor on the floor with its center at the point of the shadow, and seeing where the line of sunshine cuts the protractor. Another way is to draw the triangle of the height of the peg, the floor, and the line of the sunshine at the board and to measure the proper angle at the board. (See Fig. 1.) The children will at first say that it will take a year to measure for our earth—that they must get the lowest noon elevation of the sun in December and the highest in June. This is of course the best way but if the height can be had in December or June and at one of the equinoxes, the problem can be solved. It is well to consult the almanac and to note that the fall equinox was September 24 in 1903 and that the winter solstice was December 22. As the Berkeley class has not carried the work through a season, I will give figures obta ned in another school. Highest elevation of sun in June,

77°, lowest noon elevation in December, 29°—difference, 48°. This gives of course 24° for the inclination of the axis of our earth. Ordinarily, perhaps, the result will not be so accurate as this Thinking out the problem is the valuable part of the work. although care should be taken to get the very best result possible.

It may be granted at once that this method will take more time than to commit the ordinary text to memory or to explain directly the change of seasons. Our real object, it must always be remembered, is to develop thinking, self-reliant boys and girls, and to accomplish this we can afford to take time. Necessarily, little details have been omitted in this brief description of the plan of work. Any teacher interested can easily add them. It may possibly be well to remind teachers who begin this work at the December solstice that the increase in elevation of the sun is very slow for the first two weeks. The lack of a gyroscope should not deter any one from attempting to teach the subject by this method. Any top stands upright when it is spinning rapidly and can not be upset by any moderate blow. When it is not spinning it is almost impossible to balance the same top so that it will stand upright even for a second. Again, if one holds the wheel of a bicycle (taken from the frame) by the ends of its short axle he will find it hard to change the direction of the axis if the wheel is whirling. Either the top or the wheel illustrates the same point as the gyroscope.

In the observation work that is carried along with these lessons the children will have noticed the change in the time of sunrise and of sunset and will have correctly given the short day as one cause of winter. They should also be required to show with the globes that an earth with a vertical axis has always and everywhere equal days and nights, and that an earth with its axis inclined has days and nights of varying length.

MEDIÆVAL TRADE AND TRADE ROUTES*

BY C. RAYMOND BEAZLEY, M. A.,
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IN the development of the world's commerce and trade routes, history meets geography very closely, and the geographical teacher can find in this subject many excellent lessons afforded him by historical research, just as the historical teacher cannot here neglect the suggestions, the conditions, and the limitations of geography. Trade routes

* Abstract of Lectures given at the Oxford Summer Meeting, August, 1903, and reprinted by permission from the *Geographical Teacher*, October, 1903.

can only run where the Earth-surface is favorable; but a sufficient amount of favor is shown by wide tracts of that surface; there is an extensive possibility of choice and change; and historical events have constantly modified, and sometimes revolutionized, the course of the great trade channels. At the same time, history has constantly neglected to consider adequately the mercantile, economic, and geographical elements in man's advance and the evolution of modern society.

If we look for the central principle in the history of the World's exploration, we shall find that commerce, the search for material gain, has been the most permanent, vital, and effective spring of progress. Religion, science, and politics—the missionary spirit, the pilgrim spirit, the spirit of adventure, the colonizing spirit, the scientific spirit, the political spirit—these have all played their part, they have all done much. But none of these has the importance of trade in the opening up of our world, in the development of geographical knowledge. Trade ambitions are the most powerful factor in bringing about a continuous, progressive enlargement of the horizon in making discovery a lasting gain to the race. Trade decadence marks the Dark Ages in Western Europe, more, perhaps, than anything else. Trade revival coincides with, and is a main cause of, that mediæval and modern Renaissance which begins in the eleventh century, on the eve of the Crusades, and has continued ever since.*

The ancient trade routes continue far into the Middle Ages—with changes, it is true, but only changes of masters, of products, of comparative importance. And these trade routes are mostly, both in pre-Christian and in early Christian times, from west to east, or from east to west, moving, like the great mountain ranges, along the length, or longitude, of the old world. The amber trade of the Baltic coast, the fur trade of the northern forests, and the gold, ivory, and slave trades of

* Contrast the permanent, effective discovery of China for Europe, by the mercantile spirit of the Polos, in the thirteenth century, with the comparatively ineffective religious discovery of the Celestial Empire by Nestorian missionaries from A. D. 635 or with the still less effective and permanent diplomatic discovery by Roman envoys in A. D. 166, 284, etc.

Contrast the permanent Columbian discovery of America, so largely inspired by mercantile ambitions, with the transitory discovery by the Northmen in the tenth and eleventh centuries, a discovery mainly adventurous (which essays colonization, but in vain).

Contrast the permanent attempts to circumnavigate Africa, before a settled commercial purpose inspired the enterprise, with the success of the same considered as the opening up of a new trade route of primary value in the thirteenth to the fifteenth centuries.

the East African shore are the chief flank divisions of the great stream of international commerce flowing from Britain and Spain to India and China.

Looking, first, at these trade routes from a Mediterranean or European standpoint, we may instance among the more important the Black Sea way from the Bosporus to Trebizond, and sometimes to other ports of Armenia and Caucasia. This route crossed the isthmus of the Caucasus, traversed the Caspian, and ascended the Amu or Oxus to the rich lands of Western Central Asia (Bukhara, Samarkand etc.). Another branch of the same route passed over North Armenia and through North Persia, just to the south of the Caspian. In "Sogdiana" it met with other trade routes in profusion; for the Soghd was the true heart of Central Asia, at least from the ninth—probably from the eighth—century, and even in Ptolemy's time (*c.* A.D. 130) it had great mercantile importance. Upon it converged the three great Chinese western tracks, one of the most important routes from India, and various much-frequented roads from Southwest Asia. The Trebizond path of commerce is perennially active; but it is most important in the Mongol era, and for a century after the destruction of Bagdad and the consequent rise of Tabriz (*c.* A.D. 1258–1360).

The Euphrates route, uniting (at Rakka or Callinicum, in Northeast Syria, on the upper course of the great river) with many shorter mercantile ways from the Mediterranean coasts, brought the traveler down to the Persian Gulf, and thence either by sea or land along that dreary south coast of Persia and Baluchistan to the Indus and Sind. By the former. Alexander's fleet returned to Mesopotamia; by the latter, his army.

The north and central Persian routes, skirting the southern edge of the Caspian, or running through Mosul and Northern Mesopotamia, passed through Merv to the Amu and Sogdiana. Till its sack by the Mongols, in the thirteenth century, Merv, "Antiochia Margiana," was one of the chief centers of the trade of upper Asia—from the age of Alexander the Great to that of Genghis Khan.

The Red Sea route, connecting Egypt and the Mediterranean world with India (and at times even with China), by way of Aden and the South Arabian ports, was also important as bringing the products of tropical Africa to the "Roman Sea." By means of this route the horizon of the Ancient World was extended (in the time of Pliny and Ptolemy, *c.* A.D. 50–170) to the Zanzibar Islands and the equator; while the early Moslem traders pushed on still farther along this path to Madagascar, the Mozambique Channel, and Sofala. Here the Europeans,

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coming from the west, round the Cape of Good Hope, met the Mohammedan traders of the Indian Ocean, whose southward terminus had been Cape Corrientes.

The northern fur and amber trades followed, for the most part, the courses of the rivers which formed the natural highways between Baltic, Euxine, and Mediterranean lands—the Düna or Western Dvina, the Dnieper, the Vistula, the Memel or Niemen, the Dniester, or the Prut. Easy portages, as in the backwoods of North America, connected the upper courses of these streams or their tributaries. This route was also followed by Norse, Danish, and Swedish traders, and travelers to Constantinople, the Mediterranean, and the Holy Land, in the age of greatest Scandinavian activity.

A route of minor importance, but of great historic interest, connected with the main Black Sea avenue of commerce, ran from the lower Danube round the north of the Euxine, thence moving eastward either to the north or south of the Caspian: this was occasionally employed by the Byzantines in their sixth-century intercourse with the Turks, and became of great importance in the Mongol age (thirteenth and fourteenth centuries).

The Tigris route from north to south was not very important before the rise of Bagdad (*c.* A.D. 750). The Freshwater Canal route from the Nile to the Red Sea, connecting the Mediterranean with the Indian Ocean, was, on the other hand, prominent at certain periods of the earlier Middle Ages. The canal, however, was often choked and disused; it was finally abandoned A.D. 767.

Looking at these trade routes from an eastern standpoint, we may distinguish three chief highways between China and the Western World —one running to the north of the Tian Shan, the second to the south of that range, while the third skirted the northern face of the Tibetan Plateau, masked by the Kuenlun Range. All these met at the western extremity of the Great Wall on one side, and in the Sogdiana oasis (Samarkand, etc.) on the other. In Ptolemy's age (second century A.D.), the Græco-Roman merchants who traded with the Silk Land seem to have preferred the second and third of these routes, and especially the Kuenlun way; most Chinese travelers to the west, on the other hand, appear to choose the first, or northern Tian Shan road. From Fergana and Eastern Turkistan the Kuenlun path (the third Chinese road to the west just noticed) threw off an important sidetrack over the Indian Mountains southward into the Indus Valley, where men, passing down the river, reached a seaboard in direct communication with the Persian Gulf, the Red Sea, and the Mediterranean.

The limitations of the Ancient World are always perplexing us; the successes gained by the pre-Christian civilization are constantly suggesting yet greater things unattempted or unachieved. In a sense, perhaps, the light that was in the world proved to be darkness. The Helleno-Roman World, as organized under the Cæsars, was so rich, so self-sufficient, so full of proud contentment, so weary of struggle after many centuries of conflict, that it made little serious effort to explore beyond its own limits. For instance, there was felt no want of a commercial route by water around Africa; the Phœnicians, six hundred years before Christ, claimed the discovery of that waterway; but, in the heyday of old civilization, no adequate attempt was made, under far easier conditions, to repeat the experiment. It could have been successfully carried through, without doubt, under the Julian or Flavian or Antonine emperors; but it had ceased to appeal to practical men, though it still attracted the learned and the imaginative. Again, while the ancient coast and overland routes—by caravan or river boat or coasting vessel—were in good order, even the most adventurous did not seriously think of the great voyage from west to east, "from Spain to India," which was believed in as a theoretical possibility (*e. g.*, by Aristotle), fully eighteen hundred years before it was realized by Columbus and Magellan. The discoveries of the Great Forty Years (1480–1520) were not anticipated in the times of Strabo or of Ptolemy, chiefly because the same suggestions of vital gain did not occur to the sublime self-satisfaction of imperial Rome. The compass and quadrant were then unknown, it may be said, and nautical science was in its childhood. But, if Greek thought and Roman perseverance had given attention to the problems of ocean travel, the progress of later centuries would certainly, in great measure, have been anticipated. But the intellect of the later classical time was interested in the theory of the world—its shape and size—far more than in the practical exploration of the same.

The ancient trade routes, as already noticed, continue far into the Middle Ages almost unaltered; but, as regards the west, their activity decreases, their scale of supply and demand is lowered, their good order and safety are seriously impaired.

In the sixth century A.D., the Byzantines try to divert the overland commerce (from China, India, and Central Asia) away from the Persian routes, which most of that commerce then followed. Two attempts are made with this object: (1) by the Indian Ocean routes, and in alliance with Abyssinia; (2) by the Black Sea and steppe routes, in alliance with

the Turks of Sogdiana. Both these attempts had special relation to the silk trade, important both under the Old Empire and in the Middle Ages; this trade had long been in the hands of the Persians as carriers.

The first attempt involved an alliance with Abyssinia, and with the Nestorians of Persia, South India, Sokotra, etc.; it brought about the visit of Nonnosus to the Negus' Court, and the visits of Sopater and Cosmas to Ceylon (before 545); and it produced the valuable writings of Cosmas on the regions of the Indian Ocean, the Red Sea, etc. In these writings there is a great advance on previous Christian knowledge of South Asia and East Africa.

The second attempt involved alliance with the Turks, then ruling in Samarkand and over vast regions north of the Amu (the camps of their khans are always in motion; sometimes they are in the Soghd, or near Kokand, at other times near Lake Balkhash, or in the Lower Altai regions, etc.). This alliance produced many valuable travels between the Bosporus and West Central Asia, and good records of the same. These travels really proved the Caspian to be an inland sea, and not a mere gulf of the Arctic Ocean; but this lesson was not properly drawn except, perhaps, at Constantinople—*e. g.*, St. Isidore of Seville at this very time repeats the old misconceptions. Excellent descriptions of the Turco-Tartar nomades were now given in Greek, recalling Herodotus, Hippocrates, and Strabo. Hence also comes one of the earliest notices of Lake Aral, and of the Rivers Ural and Emba; the better known Volga, Syr-daria or Jaxartes, Don, Dnieper, etc., are clearly described or referred to by the Byzantine historians of the sixth century. This intercourse lasts from 568 to 590 or 595; its central object is to "transfer the sale of silk from the Persians to the Romans"—*i. e.*, it is a commercial object that inspires the whole. Also, under Justinian (before A.D. 565), the secret of silk manufacture is transferred from China to the Byzantine Empire by Nestorian monks, who bring silkworms' eggs in a hollow cane to Syria. This remains the most permanent result of the new Byzantine enterprises. In Western Europe, during all the period of the earlier Middle Ages, commerce is extremely depressed; yet there is occasional surprising evidence of its vitality—*e. g.*, Gregory of Tours tells of merchants going from France to Syria, and of a merchant pilgrim coming from South India to France (about A.D. 550); also of Indian ships coming regularly at the same time to Suez "for the sake of merchandise." Note also the colonies of Syrian traders in Marseilles, Narbonne, Bordeaux, Orleans, Tours, etc., under the Merovingian Kings (sixth–eighth centuries), as well as the commercial prosperity of Venice, beginning in the sixth century.

The rise of Islam produces incalculable effects in commerce as in politics. Moslems now control the most important sections of the great international trade routes, and are practically masters of the world's carrying trade. A wonderful development of Indian Ocean trade and trade routes occurs under the early Caliphate, and before A.D. 1000 Moslem traders visit North China, Korea, and Japan. Already in A.D. 700 they are found trading in Canton; in 758 they head serious riots here; in 795 they transfer their main Chinese market from Canton to Khanfu or Hangcheufu, near the mouth of the Yangtse, the greatest Chinese port throughout the Middle Ages. Kala, in the Malay Peninsula, is their chief market in the East Indies. Ceylon is also important, and Arab merchants appear here long before Mohammed; even about A.D. 400. Arab trade colonies, also, on the Malabar coast and in Northwest India, are pictured in glowing colors by early Moslem travelers and geographers before A.D. 1000. Within the Caliphate, the courses of the Tigris and Euphrates and the Persian Gulf routes acquire new and special value, and are indeed primary after the foundation of Bagdad (A.D. 750). Busra, at head of Persian Gulf, Maskat, Siraf, and Kishm, predecessor of Ormuz, close to the mouth of the gulf; Aden, the key of the Red Sea; Jedda, the port of Mecca; Suez, "where Egypt met India;" Mozdishu, on the Somali coast; and the far eastern harbors of Kala and Khanfu, or Hangcheufu, are the chief centers of the ocean trade of Islam down to the Crusading Age. On the other hand, the overland routes are somewhat depressed during the early centuries of Islam; but along the northern frontier of the Caliphate, from the Pamir and the Syr-daria to the Caucasus and the Volga, there is a surprising amount of commerce and a surprising variety of commerce avenues. Those already noticed—the Amu-Caspian-Caucasian-Euxine route, the steppe routes north of the Euxine and the Caspian, the South Caspian or North Persian road—are now of considerable importance, though quite secondary to the great maritime coast tracks of the south. The fur-trade route, running up the course of the Volga into the far north, is also valuable, owing to the passion of rich Moslems for furs; its chief terminus is at Bolgharar (answering to the modern Kazan).

All Moslem trade routes are summarized by Ibn Khordadbeh, about A.D. 880. Great importance is assigned by him not only to the routes noticed above, but also to the North African caravan route, skirting the north edge of the desert, from Morocco to Egypt. He also emphasizes the commercial position of the ports of France and Italy, even then, and of the market town of Rhé or Rai, near Teheran, where Slav, Khazar, and Levantine traders met. He also gives an elaborate account of a

Central European trade route from Southern Germany eastward, running through the Slav lands to the lower Volga, and thence on to Central Asia, India, and China.

The early triumphs of Islam, following on the barbarian invasions, for a time almost stifle the commercial life of western Christendom, and Moslem piracy for a moment apparently completes the destructive work of Moslem conquest. While the East and West Caliphates develop commerce of their own, of immense reach, depth, and volume, the Christian lands outside the Byzantine Empire seem commercially dependent on their more prosperous rivals. But gradually matters alter, the outlook changes, and the central period of the Middle Ages is marked by a mercantile development of decisive character; a new era in trade, as in politics and society, is created; and whatever the other fluctuations of European history, in commerce the Mediæval Renaissance, beginning on the eve of the Crusades, is an abiding and vital force. This steadily grows till Europe arrives at the discovery and trade exploitation of the entire world.

The new European mercantile life really begins as a continuously progressive force in Italy and the south of France during the ninth century—especially at Venice and Amalfi, and to a less degree at Marseilles. This mediæval mercantile life is superior to the ancient commercial activity in claiming greater privileges for the trader, in giving more attention to freedom of trade intercourse, in undertaking more daring and speculative operations, in devoting greater energy to the discovery of new markets. At the conclusion of the Crusading struggle it is evident that the solid results of the religious wars are mainly commercial—a new culture and material prosperity, a vastly extended knowledge, a well-informed and far-reaching ambition, whose results are seen in the great scientific and geographical discoveries of the latest Middle Age.

The Crusading States of the Levant, advanced bases for Christian trade, help the Christian travel-pioneers, especially merchants, to penetrate the inner regions of Asia. Thus Italian and Provençal merchants push up to Aleppo, Damascus, and the Euphrates before A.D. 1200. Some time before 1264 we find a Venetian trader in Tabriz, the North-Persian successor and supplanter of Bagdad. The conquests of the Mongols are first announced to Christendom by European traders in gems and spices who had gone up, about A.D. 1200, from the Syrian coast towards the Euphrates.

New routes and new markets are opened by the Latin capture of Constantinople (A. D. 1204), and the rise of the Mongols (from A. D. 1190).

Venetians are now established as commercial sovereigns on the Bosporus and the Black Sea: their traders penetrate to Kiev, into the heart of Asia Minor, into Persia, into Central Asia, finally, with the Polos, into China, Indo-China, and India.

The Mongols open continental (overland) routes, as they have never been opened before, to Christian trade and travel. The opportunities given by Mongol rulers to European merchants result in that new knowledge of India and China which, above all else, inspires the great geographical discoveries. For Henry the Navigator, Dias, Da Gama, Columbus, Magellan, and the rest are all primarily in search of better and easier ways to Cathay and the Indies. The difficulties of the land routes are well known by the fourteenth century; the value of the objects and regions sought are also thoroughly apparent to the searchers; the first hopes of profitable overland intercourse (raised by the Mongols) have now been completely disappointed; therefore, men seek for maritime, oceanic ways. Hence the circumnavigation of Africa, the western route by voyages of Columbus, the reaching of East Asia by a western course from Europe (by Magellan), the incidental discovery of the unsuspected land-mass of America (by Columbus).

The importance (in the Mongol period) of the Trebizond—Tabriz and Lajazzo—Tabriz routes (from the Black Sea and the Cilician coast to North Persia, and so to China by the way running south of the Caspian) is very notable.

Only second to these come the steppe routes—*e. g.*, from Kiev or the Crimea to the lower Volga, and so to the Mongol capitals and China by tracks running north of the Caspian—while, again, the river routes are not to be forgotten—*e. g.*, the Don-Volga way into the Caspian (crossing over by the Kalach portage from one river to another); also the Amu route. But before the close of the Middle Ages both Mongol and Moslem alliances for commercial purposes are clearly seen to be futile experiments, ending in utter disappointment. Good examples of the latter exist in the attempts of European traders in the twelfth, thirteenth, and fourteenth centuries to reach the Indies through an understanding with the Moslem rulers of Egypt. Some of these are temporarily successful—*e. g.*, the Pisans in A.D. 1175, the Germans about 1240, the Venetians about 1330—but none are permanent.

The routes of the Polos in their two great journeys (1260–1295) give an excellent view of the chief trade avenues in the Mongol period.

I. On the first journey the outward route was: Crimea, Volga, Bukhara, over the dividing mountains by the southern Tian Shan way, over the Gobi to the Great Wall, Kublai's Court at Shangtu. II. On

the second journey: Lajazzo, Erzinghian, Mosul, Ormuz, Badakhshan, over the dividing mountains by the Northern Kuenlun way, Great Wall, Pekin, various routes in China (*a*) to Southwest, (*b*) to Southeast, especially to Hangcheufu, the "City of Heaven;" home from Zayton, in Fokien, by the coasts of Indo-China, through the East Indies, along the Coromandel and Malabar coasts to Ormuz, Tabriz, Trebizond, Constantinople. The Red Sea routes are elaborately described in the Polo narrative, but not apparently from first-hand observation. We must notice the importance of the Nile and of Alexandria in international trade even at the close of the thirteenth century.

The persistence, daring, and success of Christian traders, even from the beginning of the Crusading Age, correspond to an ever-increasing weakness and decay in Moslem commerce, which from the seventh to the eleventh century had controlled the world's purse-strings. Commercially, as in some other respects, Islam never recovered from the Mongol convulsion; *cf.* Polo's evidence on the vast superiority of the Chinese ports over Alexandria at the close of the thirteenth century.

So the break-up of the Mongol Empire and the conversion of the Western Tartars to Islam destroy Christian hopes of effective overland trade through Asia. A thorough knowledge, we have seen, now prevails in the west of the riches of South and East Asia. These riches are accordingly sought by the longer but safer maritime routes. The chief stages in this search are the following: In 1270, European discovery in the African islands and off the African coasts begins again with the voyage of Lancelot Malocello to the Canaries; in 1291, we have the first overt attempt to reach India by an ocean voyage round Africa, planned for strictly commercial purposes; in 1341, 1346, 1402, etc., European voyages are repeated among the African islands, and renewed attempts are made to coast on beyond the farthest hitherto known. Valuable discoveries are made among the Canaries, the Azores, and the Madeira group, even before 1351; but permanent, continuous, effective Atlantic exploration only begins under the leadership of Henry the Navigator, 1415–1460; the route around Africa is practically opened up by 1486 (Bartholomeu Dias), absolutely by 1498 (Vasco da Gama). The greatest commercial revolution ever known is produced by this, by the discovery of America in 1492, and by the Ottoman conquest of the Levant, which last dealt a deathblow to Moslem commercial spirit, just as the Ottoman conquest of the Crimea and other coasts of the Black Sea dealt a deathblow to the old Christian trade by this route with Central Asia, China, etc.

GEOGRAPHICAL NOTES

The Production of Sugar in the Hawaiian Islands.—A statement recently received from a high authority in Hawaii by the Bureau of Statistics indicates that about one hundred million dollars of capital from the United States have been invested in Hawaii since the reciprocity treaty of 1876, a large part of this having been so invested since annexation, in 1898. This development, since annexation, in the increased investments in capital from the United States, and its application to irrigation in its highest forms, has resulted in an increase of more than 50 per cent in the sugar production of the islands, the production of 1897 being 562,000,000 pounds; that of 1903, 840,000,000 pounds.

The Hawaiian Islands now stand third in the list of sections producing cane sugar for exportation. Curiously, all of the great cane-sugar exporting spots of the world are islands. Cuba stands at the head of the list, with an annual exportation, under normal conditions, of over two billion pounds; Java next, with an average annual production of one and one-half billion pounds, while the Hawaiian Islands have now nearly reached the one billion mark. China and India are also large producers of cane sugar, but consume practically all of their production, their exportation being small.

Sugar production in the Hawaiian Islands has developed much more rapidly during the last thirty years than in any other cane-producing section of the world. The production in Java grew from 432,320,000 pounds, in 1875, to 1,887,899,000 pounds, in 1903, or less than five times as much in 1903 as in 1875. Cuba has increased its production from 1,736,000,000 pounds, in 1873, to 2,183,000,000, in 1903, while that of Hawaii, as already indicated, has grown from 23,000,000 pounds, in 1873, to 840,000,000, in 1903. Thus, Java's production is now less than five times that of 1873; that of Cuba has increased less than 50 per cent, while that of Hawaii is about thirty-five times as great as in 1873. Meantime, the cane-sugar production of the world has grown from 1,793,000 tons, in 1873, to 4,118,000 tons, in 1903, having about trebled during that period. The beet-sugar production of the world has grown from 1,210,000 tons, in 1873, to 5,520,000 tons, in 1903, being about four and one-half times as much in 1903 as in 1873.

Hawaii's share in supplying the sugar consumption of the United

States has increased very rapidly since the reciprocity treaty of 1876. Prior to that date, sugar imported from Hawaii formed about 1½ per cent of the total importation, while in the fiscal year 1903 Hawaii supplied about 15 per cent of the total brought into continental United States.—*Bureau of Statistics, Department of Commerce and Labor.*

The World's Maritime Statistics.—"Lloyd's Register" for 1903-4 puts the world's mercantile marine, on July 10, 1903, at 29,943 steamships, of 27,183,365 tons, and 12,182 sailing vessels, of 6,459,766 tons. The principal nations are represented in the following table:

Country	*Tonnage*	*Country*	*Tonnage*
England	16,006,374	Holland	658,845
United States	3,611,956	Denmark	581,247
Germany	3,283,247	Austria-Hungary	578,697
Norway	1,653,740	Greece	378,199
France	1,622,016	Belgium	157,047
Italy	1,180,335	Brazil	155,086
Russia	809,648	Turkey	154,494
Spain	764,447	Chile	103,758
Japan	726,818	Portugal	101,304
Sweden	721,116	Argentine Republic	95,780

Area, Population, and Density of Population of the South American Republics.—

Country	*Area (Kilometers)*	*Population*	*Density of Population per Kilometer*
Argentine Republic	2,894,257	4,094,911	1.41
Bolivia	1,822,350	3,920,207	.99
Brazil	8,361,350	14,668,268	1.75
Colombia	1,203,103	3,001,151	3.26
Chile	658,542	1,816,271	4.56
Ecuador	299,600	1,204,200	4.02
Paraguay	253,100	502,000	1.91
Peru	1,137,000	2,629,663	2.31
Uruguay	178,700	827,485	4.63
Venezuela	1,043,900	2,444,316	2.35
Total	17,851,902	35,108,472	2.72

Manufacture of Ice in Palestine.—There is a small ice plant in Jerusalem, which has been in operation for three years. An oil engine of three horse-power furnishes the power; the freezer is of French manufacture. The sale of ice amounts to about 700 pounds a day, and the capacity of the works is about 1,400 pounds daily. The selling price is 5 cents a kilogram (2.2 pounds). Never before in

this country have the inhabitants used ice, or seen it, in fact. The demand at present is limited, but is steadily increasing.

At Jaffa, the seaport of Jerusalem, the ice business was established about 1890 on a small scale and for several years the business was not successful; but, in 1899, as the demand for ice was on the increase, the works were enlarged, and since then have been operated quite successfully. The engine used is of German manufacture; oil is used for fuel. The present daily demand is for about 1,500 pounds, and the capacity of the works is about 4,500 pounds. The price is the same as charged in Jerusalem—5 cents per kilogram. When the works were first established the price was 10 cents per kilogram. The water in Jaffa comes from wells, and, owing to their proximity to the sea, is brackish. The ice is never clear, and when melted leaves considerable sediment. The water used in Jerusalem is rain water, from cisterns, and the ice is like crystal. No natural ice is brought to this country. The demand for ice was first made by the hospitals; the hotels soon after began its use, and now nearly all the foreign residents and many of the wealthy native families are consumers.

Raising Crops in the Far North.—Mr. N. L. Skalosubof, addressing the recent agricultural convention at St. Petersburg, said that many facts may be given to disprove the popular idea that grain will not ripen north of 60° N. Lat. A clergyman at Yugansk, Siberia, 61° N. Lat and 73° 40′ E. Long., is building a mill propelled by wind-power to turn his winter rye and spring wheat into flour. At Masau, on the Pelym River, in 61° N. Lat., a farmer has extended his area under tillage, so that he now raises all the grain required by his large family, and has a surplus to sell. The efforts to raise rye at Berezov in 63° 54′ have been very successful. Still farther north, in 64° 13′, barley, rye, and oats have been grown for a series of years, and yield fifteenfold. Vegetables are raised at the most northern line of Russian settlements—for example, at Obdorsk in 66° 31′, where the successful experiment was first made in 1894.—*Bulletin American Geographical Society*, October, 1903.

Standard Time in South Africa.—The Governments of Cape of Good Hope, Natal, Transvaal, Orange River Colony, Rhodesia, and Portuguese East Africa, having decided to adopt a standard time for railroads, telegraphs, and other public purposes, have agreed that the time shall be that of the meridian 30° E. Long.—that is to say, two hours in advance of Greenwich time. The arrangement took effect from March 1, last.—*Bulletin American Geographical Society*, October, 1903.

XUM

Manufacture of Perfumes in Grasse.—The city of Grasse, the most important industrial place of the Riviera, is widely known on account of its perfume manufacture. At present thirty-five concerns making essences of flowers are in operation there. The average consumption of roses for that purpose is about 2,650,000 pounds, and that of orange flowers about 660,000 pounds per year. The annual sale of these essences amounts to $1,000,000. Vallauris has nine such factories.

The most important product of this industry is ~~oil of~~ neroli, made from the flowers of the bitter orange. A kilogram (2.2 pounds) of this oil is worth $60. From the peel of the bitter orange oil of orange is made. The peel of the sweet orange is seldom used for making oil.

The manufacture of essence of roses is also very extensive. The so-called oil of roses is manufactured from the grass *Andropogon schoenanthus*.

The flowers of the large flowered jasmine yield the oil of jasmine. A hectare (2.471 acres) planted with jasmine is said to yield a yearly product worth $3,000, but requires a great deal of work. Filled violets formerly brought from $1 to $2 per kilogram (2.2 pounds); at present, however, they bring only 50 cents. A kilogram of essence of violets is worth from $4.50 to $5.

Oil of geranium is produced from the flowers of *Pelargonium capitatum*. The flowers of the tuberose, of the jonquil, and of a species of narcissus are manufactured into essences; also the leaves of the citronella plant, the root of the *Iris florentina* (violet root) the patchouli flowers, sandalwood, etc.

Fortunately for many places in the Riviera, the consumption of these essences has not decreased in late years.

Although many of these perfumes are bad for the nervous system, others are recognized as antiseptics.

Destruction of Cork Forests in Italy.—While Spain still furnishes 32,800 tons of cork annually, the production of Italy has decreased to 4,000 tons. The value of the Spanish exports of cork amounts to $6,000,000 per year, against less than $250,000 for Italy. Only Sicily and Sardinia are still producing cork to any considerable extent in Italy, while the former great oak forests of Calabria are almost totally destroyed. It seems incomprehensible that this destruction has been permitted. The trees easily reach an age of two hundred years. They yield cork in their thirtieth year and continue to do so every seven years. Seventy-five years ago the English demand for cork was supplied exclusively from Italy. The destruction of the remaining forests goes on uninterruptedly, and nobody seems to try to prevent it or to plant

new forests, in spite of the fact that Italy possesses the most favorable climate and soil for the cork oak, the most favorable conditions for its growth being found in the volcanic soil of the peninsula.—*Monthly Consular Reports, December,* 1903.

Current Articles on Commerce and Industry :

DECEMBER

Agaves: A Group of Useful Plants (Illus.), *Sci. Am. Supp.*, December 12.

British Columbia Water Powers (Illus.), *Engineering Mag.*

California in Winter (Illus.), *World To-day.*

Canada, American Invasion of (Illus.), *World To-day.*

Ceylon: Impressions of the Far East (Illus.), *World To-day.*

China, Railway Making in (Illus.), *Engineering Mag.*

Coal-Mining in the United Kingdom, *Engineering Mag.*

Corn Belt, Life in, *World's Work.*

Diseases of Farm Animals in Am., *Sci. Am. Supp.*, December 5.

East River Bridge (Illus.), *Sci. Am. Supp.*, December 19.

Farming: The New Farmer and a New Earth (Illus.), *World's Work.*

Hemp Industry, *Sci. Am. Supp.*, December 5.

Insect Pests in Am. Agriculture, *Sci. Am. Supp.*, December 12.

Iron and Steel (Illus.), *Sci. Am. (Special Edition)*, December 12.

Irrigation in Ancient Chaldea, *Sci. Am. Supp.*, December 12.

Korea and International Politics (Illus.), *World To-day.*

Louisiana Sugar Plantation (Illus.), *Country Life.*

Orange Crop of the U. S., *Crop Reporter.*

Paris, Metropolitan Railway of (Illus.), *Engineering Mag.*

Philippines: Commercial Fibers of, *Mo. Summary of Commerce of the Philippine Is.*, July.

Philippines: Progress Among the Moros (Illus.), *Rev. of Revs.*

Potato Cultivation in Germany, *Consular Rep.*

Primitive Inventions (Illus.), *The Craftsman*, November.

Rubber Tree of Central America (Illus.), *Sci. Am. Supp.*, December 5.

Sarsaparilla, *Paint, Oil and Drug Rev.*, December 2.

Scotch Oil Industry, *Paint, Oil and Drug Rev.*, December 16.

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Speculation and Business (Illus.), *System.*

Standard Oil Co., Part II, Ch. I (Illus.), *McClure's Mag.*

Warehousing Industry, *Mo. Summary of Commerce and Finance.*

Who Owns the United States? *World's Work*

GEOGRAPHICAL QUERIES

A CLEARING HOUSE FOR GEOGRAPHICAL WANTS AND DOUBTS.

IT is hoped this department will prove of practical benefit to teachers of geography, opening a way for the solving of the many geographical problems which are constantly met with in the classroom. All questions received will be answered by specialists in the various methods of geographical work. We invite inquiries, criticisms, suggestions, and discussions. Address all communications for this department to: EDWARD M. LEHNERTS, *Winona, Minn.*

(6) Having noticed a tendency in the schools to combine language lessons with the teaching of geography, I would appreciate a statement from THE JOURNAL OF GEOGRAPHY as to where, in its opinion, lies the value of this correlation of one pedagogical subject with another.
M. FAULDS, Aylmer (West), Ontario, Canada.

The function of language is to express thought. Language fulfills its function when it enables the individual to convey to others his states of consciousness. That form which expresses thought most clearly and most concisely is the best form.

Any one who has watched the development of children before they enter school, knows how rapidly they acquire the ability to use language. Early childhood is a period of intense activity. It is a stage of inquiry, of desire to know. The world is rapidly unfolding before the eyes of the child, and he cannot remain passive in the presence of such wonders. Expression becomes a necessity, and hence the power to use language develops rapidly.

To the teacher this fact should be very significant. It is at once associated with the immediate needs and desires of the child, and with his present environment. Why not follow this method in the school? Create a desire to possess, and you have implanted in the mind that which is fundamental in leading to possession. It is evident that this desire will grow out of that in which the child is most deeply interested — his environment — for in this his experiences are bound up.

In the study of geography we are constantly dealing with objects of interest, beauty, use. We are studying processes which influence the daily life of every living thing. Types of the objects are ever before the pupils. The processes by which the world has been and is being shaped are at work upon every hillside and highway, along every stream course, and in the very atmosphere about us.

Geography thus opens an unlimited field for training in the use of language, both oral and written. Let the pupil be taught to express his

growing personal experiences in the best form. Mistakes must be discovered, with or without the aid of the teacher, and must be corrected by the pupil. Demand the child's best in all work.

How shall we test the value of the present method of teaching language? I believe that I am quite correct in saying that it is customary to judge the pupil's progress by his record in the language class. It is in connection with geography, history, arithmetic, and other subjects that the test should be made.

Manual training involves the use of the saw, hammer, plane, and other tools. What teacher of manual training would attempt to teach the use of these tools by having his pupils saw, hammer, and plane worthless scraps of lumber month after month and year after year? Children learn how to use these tools by making something. In other words, the tools are used just as they are used in the actual affairs of life — as a means of expression. Does manual training suffer by being taught in a rational manner? Should language be taught by a method any less rational?

Language should be taught in connection with geography and all other subjects for the following reasons: (1) Its function is to express our thoughts in terms of these subjects. (2) This method is along the line of the pupil's interest. (3) It makes possible the greatest progress. (4) It furnishes a rational test of the pupil's ability. (5) It makes language a means rather than an end.

J. F. CHAMBERLAIN,
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EDITORIAL

GEOGRAPHY TEACHING IN NORMAL AND TRAINING SCHOOLS

DURING the agitation for better geography teaching in elementary and secondary schools which has been going on now for more than a decade, but little attention has been given to the problem of geography teaching in normal and training schools. Inasmuch as these schools are the source of special training of a large proportion of the teachers employed in elementary schools, especially in cities, this neglect of attention has been most unfortunate. Teachers have been spurred on by new and revolutionary texts, by new and perhaps over detailed courses of study, by constant discussion in the pedagogical journals, and have been urged to make striking changes in their methods of teaching and in the choice of materials to be presented in classroom work, while little attention in a connected way has been given to the

improvement of geography training in the professional schools for teachers.

In several of the normal schools, particularly in the western states, the task of training pupil teachers in geography has been entrusted to teachers who have had opportunities of specializing in geography during their academic training. Even these trained leaders have not, however, compared notes and discussed plans of work, as have the teachers in secondary schools. As a result, the normal school teaching of geography in the country at large is at present uneven in method, in point of view, and in results.

Students who have gone through a two years' normal or training course, following a high-school course, ought to have gained that knowledge of geography, and of methods of teaching, which will give them confidence in their work and a feeling of reserve strength beyond the needs of everyday school life. A teacher who must give to her pupils all she knows herself is to be pitied, for she is always liable to be upset by the sagacious question of some active-minded pupil who sees beyond the text and lesson of the day.

A teacher who has had the benefit of a professional training ought to know what is essential and what nonessential in geography for school work; she ought to understand the cross-relations between the several divisions of geography ordinarily separated in a school text; she should be familiar with the best sources of reference and know how to seek new and additional information in atlases, cyclopedias and compendia; and above all she should be able to sift the small amount of accurate and valuable material from the vast abundance of geographical chaff poured forth from the press, and especially from the daily press.

There is no field of school work in which a knowledge of geography is of more immediate value than in the current events class. Any teacher who has not gained from her professional course in geography a knowledge of facts and principles that will be of everyday service and consolation, has been negligent in her work or has been trained in a bad way.

It is for the purpose of showing how these ideals can be obtained that THE JOURNAL begins this month the publication of a new series of articles[1] dealing with the geography courses in several of the progressive normal schools of the country. The editors will welcome further contributions to the subject, either in the way of questions or discussions, and it is hoped that the series may be of help and inspiration to all teachers of geography in normal and training schools.

[1] See also, THE JOURNAL OF GEOGRAPHY, Vol. II., pp. 393, 469, 507.

REVIEWS

The Geography of Commerce. By Spencer Trotter. Size 5 by 7½ inches. Pp. xxiv and 410. New York: The Macmillan Company, 1903.

A crop of books is now appearing on the subject of commercial geography. The *Elementary Commercial Geography* of C. C. Adams was reviewed in these pages recently. The book of Dr. Trotter is similar in scope and purpose.

This is the first volume of Macmillan's Commercial Series. The editor's introduction indicates that the series is to contain two books on geography in relation to industry; namely, one devoted to the physical laws and facts influencing industry, and one developing the "standpoint of men and organizations of men." The author appears to dissent, for on the first page of Chapter I we find the statement that "Geography is used in the following pages in its broad meaning, and includes an account of man and nature, and the interactions which are an outcome of their relationship to each other." We venture to protest that commercial geography is so new a study in American schools, and its aims and methods, its disciplinary value, and its place in the curriculum are all so uncertain, that to split the various viewpoints of the subject apart into separate books will be to introduce the greatest confusion. Furthermore, it must be urged that to divide the subject along the lines proposed will be to prevent the effective juxtaposition of facts within a volume, in the effort to reveal the essential conditions of industry as they arise, partly from the physical environment, partly from the culture, laws, customs and institutions of human society, and become intimately associated in the process of wealth production.

While there is much that is excellent in the book before us, and while the suggested questions and topics and the bibliographies following each chapter give evidence of much careful work, it must be admitted that the text proper is disappointing, both because of an unsatisfactory general plan for the arrangement and balancing of the various topics treated, and because the substance of the individual paragraphs is composed of the more obvious and superficial facts of industry, and these are not sufficiently digested in relation to any body of general principles which the student may seize upon and retain after the specific facts have been forgotten or have become out-of-date.

The photographs with which the book is embellished are excellent; the charts also are correct in principle though by no means striking. The maps are quite ordinary in character; some of them, like the thumb-nail maps on pages 90, 92, 99, and 102, are too small to show much of importance; others are overloaded with data, as illustrated by the map of South America on page 208; while some are decidedly inaccurate, like the map on page 53 comparing the area of European countries with that of the United States.

E. D. J.

Elementary Geography. A Text-book for Children. By Charles F. King. Size 10¼ x 8¼. Pp. vi, 220. 26 maps and numerous illustrations. Boston: Lothrop Publishing Company, 1903.

The author of King's Elementary Geography aims to cover the first two years of geography work. The first section deals with observational home geography—by means of trips to the park, the fields, the hills, and the seashore; elementary concepts of surface, land, and water forms, work of air and water, the weather and

the seasons are brought out. Then type forms are taken up. The child's early interests in the particular rather than the general are appealed to by the study of a mountain (Mt. Washington), a river (the Hudson), a prairie, a coast, a cold, a hot, and a temperate country. The earth as a whole is dealt with, and then the continents by means of journeys. The author has used the journey method to add interest and sequence to the work, but he has not fallen into the common error of allowing this method to breed superficiality. Vital and fundamental facts have been emphasized.

Less ground has been covered than in many geographies because it has seemed more important to appeal to the child's interest in the real, the concrete, than to attempt to cover more ground in a general manner. Cities and industries are clearly and concisely described with sufficient detail to keep interest in the reality. Some of us will question the advisability of using the personal element and story form to such an extent, and even the extensive use of the journey method in a text-book, but the book will be interesting to every teacher of geography. The general appearance of the book is noteworthy. The numerous illustrations are clear, attractive, and illuminate the text. The maps are simple and clear. L. W. H.

RECENT PUBLICATIONS

Manual of Geography and Language. By C. E. Mann, Chicago. Pp. 151. Chicago: M. A. Donohue & Company, 1903.

This latest manual of geography contains an outline of a course of geography that has been tested by use, and practical suggestions as to ways of approaching the different subjects accepted as pertinent to the course. The outlines are largely devoted to economic and industrial topics. The book contains some very helpful and suggestive questions for review purposes, but is not particularly new or individual.

Pioneer Spaniards in North America. By William Henry Johnson. Pp. xvi and 381. Boston: Little, Brown & Company, 1903.

An interesting account of explorers like Vespucius, Balboa, Ponce de Leon, Cortés, De Vaca, Coronado, and De Soto, illustrated by many reproductions of old plates and a few of old maps. A good book of reference for teachers dealing with the period of exploration in America.

Handbook of Commercial Geography. By George G. Chisholm. Fourth corrected edition. Pp. xlvi and 639. London and New York: Longmans, Green and Company, 1903.

A revised and much-enlarged edition of a well-known and standard book. A book of reference which may be used as a text in the higher grades of teaching. To be reviewed later.

Precis de Geographie Économique. By Dubois and Kergomard. Second edition. Pp. viii and 837. Paris: Masson et Cie., 1903.

An up-to-date commercial geography arranged by countries. Lacks illustrations and has a meager index. In the treatment of each country the causal idea is well emphasized, and comparisons with similar conditions in other countries are clearly brought out.

Descriptive Chemistry. By Lyman C. Newell. Pp. vi, 590. Boston: D. C. Heath, 1903.

A descriptive chemistry, primarily for teachers and students of chemistry. A valuable book of reference for teachers of geography who wish to know more about the chemical side work of the atmosphere, and water, or about other topics of similar nature.

The Land of Little Rain. By Mary Austin. Pp. xi, 281. Boston: Houghton, Mifflin & Co., 1903.

A book on the desert written by an enthusiastic desert lover who speaks from intimate knowledge. Most highly commended to all who want an adequate presentation of the truth about deserts. To be reviewed later.

The Yellowstone National Park. By Hiram M. Chittenden. Fourth edition. Pp. x, 355. Cincinnati: Robert Clarke Co., 1903.

A revised and enlarged edition of a well-known guide-book to the Yellowstone. To be reviewed later.

The Cause of the Glacial Period. By H. L. True. Pp. xii, 162. Cincinnati: Robert Clarke Co., 1903.

A review of the several theories which have been suggested to account for the glacial period, and followed by a presentation of the author's views. To be reviewed later.

The Philippine Islands, 1493–1898. Edited and annotated by Emma H. Blair and James H. Robertson. Cleveland: Arthur H. Clark Co., 1903.

Vol. II—1521–1569. Pp. 335.
Vol. III—1569–1576. Pp. 317.
Vol. IV—1576–1582. Pp. 320.
Vol. V—1582–1583. Pp. 321.
Vol. VI—1583–1588. Pp. 325.
Vol. VII—1588–1591. Pp. 320.

The beginning volumes in an inclusive series to cover the history and geography of the Philippine Islands from 1493 to 1898, when Spanish rule ceased. The volumes are translations from original documents, are well arranged and edited, and appear in a pleasing typography and form. Of special value to students of historical geography and should be found in the leading libraries.

The Philippines, a Geographical Reader. By Samuel MacClintock. Pp. 105, with four maps. New York: American Book Company, 1903.

A simple book, dealing briefly with certain of the best-known areas of the Philippines. Well illustrated and timely, but not especially interesting.

New Physical Geography. By Ralph S. Tarr. Pp. xiii, 457. New York: The Macmillan Co., 1904.

A new book in fact as well as in name, by an author whose previous texts for secondary schools have been eminently successful. Especially striking for its many maps and diagrams. Many of the illustrations and some of the diagrams are too indistinct to be helpful. It is eminently practical and will immediately be ranked as one of the less than half-dozen books on physical geography which can be used to advantage in secondary and normal schools. To be reviewed later.

XUM

NEWS NOTES

Geography at the Normal School, Trenton, N. J.—Part II of the Second Year Book of the National Society for the Scientific Study of Education is devoted to a consideration of the Relation of Theory to Practice in Education. In this there is given a suggestive outline of the course in geography given to students in the Normal School at Trenton, N. J. Here the plan is for the pupil teacher to go over the subject matter of geography, much in the same order that is followed in the practice school. Thus the course for the normal training students is closely parallel to the course in the practice school, though much more inclusive. A study of this plan, therefore, will give a good idea of the school course of study. The plan followed is somewhat at variance with the usual courses of study for pupil teachers in normal schools, but is suggestive and helpful.

A New Trial for the North Pole.—Commander Peary, the well-known and indefatigable Arctic explorer, has been given three years' leave of absence by the United States Navy and will start in July, 1904, on a new attempt to reach the North Pole from the American side.

Geographical Exhibit to be Held by the Geographical Association of Britain.—The Geographical Association of Britain, of which Dr. A. J. Herbertson is the Honorary Secretary, will hold an exhibition of books, maps, and geographical apparatus in London in January, 1904. This exhibit will be in association with a Conference on School Equipment for the Teaching of Geography, full accounts of which may be expected in the later numbers of the *Geographical Teacher*, of which Dr. Herbertson is editor. By mutual agreement between the editors, contributions to the *Geographical Teacher* which are of value in America are reprinted in this JOURNAL and a similar use is made of the JOURNAL OF GEOGRAPHY in the *Geographical Teacher*.